

REMARKS

Claims 28-31 are allowed; claims 1-8, 10-27 and 32-39 are rejected; and claim 9 is objected to as being allowable if rewritten in independent form.

Review and reconsideration on the merits are requested.

Claims 1-8, 10-27 and 32-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,069,215 to Araki et al (Araki '215) in view of U.S. Patent No. 6,790,587 to Feiring et al (Feiring '587). Araki '215 was cited as disclosing coating compositions comprising a fluorine-containing polymer derived from fluorine-containing monomers having epoxy functional groups. Feiring '587 was cited as teaching addition of a photoacid generator to an analogous fluorinated polymer. The reason for rejection was that it would have been obvious to add a photoacid generator to the fluorinated polymer composition of Araki '215 as taught by Feiring '587, so as to facilitate development by producing hydrophilic acid groups upon exposure to radiation and deprotection.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the following remarks and the test data presented in the Declaration Under 37 C.F.R. § 1.132 submitted herewith.

Araki '215 discloses a fluorine-containing polymer having a functional group such as an epoxy group, with the objective of providing a coating material which gives excellent adhesive strength directly to a substrate such as metal or glass (Abstract of Araki '215). Importantly, the fluorine-containing polymer of Araki '215 is not cured (not crosslinked). This is because the functional group is essential for exhibiting adhesive strength.

Therefore, there is no apparent reason which would lead one of ordinary skill to add a curing agent (crosslinking agent) such as a photoacid generator to the adhesive composition of Araki '215 so as to prepare a curable resin composition. In fact, adding a photoacid generator to the coating composition of Araki '215 would render Araki '215 unsatisfactory for its intended purpose. For this reason alone, it is respectfully submitted that the present claims are patentable over the cited prior art.¹

Feiring '587 discloses a photoresist composition comprising a fluorine-containing polymer having a protected acidic group (e.g., a carboxylic acid ester group) and a photoactive component (corresponding to the photoacid generator of the present invention).

As discussed above, because Araki '215 seeks to provide a coating material having excellent adhesive strength directly to a substrate and therefore does not call for a curing agent, even if the polymer of Araki '215 and that of Feiring '587 are analogous, a skilled artisan would have no apparent reason to combine those references. Of course, the photoactive component of Feiring '587 cannot be introduced into the coating material of Araki '215 without destroying the intended function of Araki '215.

Applicants believe that the present claims patentably distinguish over the cited prior art for the reasons given above. However, so as to further demonstrate the unobviousness of the present invention, Applicants submit comparative test data in a Declaration Under 37 C.F.R. § 1.132 of Takayuki Araki submitted herewith. As shown in the Declaration, the physical

¹ If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.
MPEP § 2143.01 V.

properties of the coating film of Feiring '587 does not provide a photocured product having sufficient physical properties such as strength, surface hardness and solvent resistance, which properties are required for optical materials such as anti-reflection coating films and optical waveguides. Namely, the photocured product of Feiring '587, as demonstrated in the Rule 132 Declaration submitted herewith, does not solve the problems addressed by the present invention.

In the comparative testing presented in the Declaration, a representative polymer of Feiring '587 and a fluorine-containing polymer of the present invention were synthesized and each mixed with a photoacid generator to prepare resin compositions. Coating films were then prepared from each of the respective compositions, and their physical properties following UV irradiation were evaluated and compared. Synthesis of the respective polymers is described at pages 2-10 of the Declaration. The physical properties of the respective coating films were evaluated both before and after UV irradiation, the results of which are set forth in Table 1 at page 12 of the Declaration.

The test data shows that a photoresist prepared from the resin composition according to Feiring '587 does not provide sufficient physical properties such as strength, surface hardness and solvent resistance, which are required for optical materials such as anti-reflection coating films and optical waveguides. Namely, Feiring '587 does not provide a composition which solves the problems addressed by the present invention. On the other hand, the photo-curable resin composition of the present invention does not attain sufficient properties prior to UV irradiation. However, the subject properties are remarkably improved after UV irradiation.

Although the photoresist of Feiring '587 is similar to the photo-curable resin composition of the present invention in that both comprise a fluorine-containing polymer and a photoacid

generator, the photo-curable resin composition of the present invention provides a remarkable and unexpected difference in that the physical properties of the photo-curable resin composition of the invention are drastically changed following UV irradiation. On the other hand, the photoresist of Feiring '587 does not exhibit such changes in physical behavior.

Table 1 of the Declaration is reproduced below.

Table 1

	US6,790,587		Present invention		Substrate
Fluorine-containing polymer	EXPERIMENT 1		EXPERIMENT 2		-
	Before UV irradiation	After UV irradiation	Before UV irradiation	After UV irradiation	-
Reflectance of one side of film	-	1.9	-	1.3	5.0
Pencil hardness	5B	5B	2B	HB	-
Solvent resistance	X (Completely dissolved)	X (Completely dissolved)	X (Completely dissolved)	△ (partly dissolved)	-
Alkali resistance	X (Completely dissolved)	X (Completely dissolved)	X (Completely dissolved)	○ (No change)	-

The present invention relates to selection of a certain polymer as the resin component, which combines photo properties such as low reflection and low refraction with a surface hardness and coating film strength that are acquired through UV irradiation. Thus, the photo-curable fluorine-containing resin composition of the invention is different, in an unobvious way, from the photoresist of Feiring '587, which resin composition cannot attain the above-noted physical properties required for optical materials.

RESPONSE UNDER 37 C.F.R. § 1.114(c)
U.S. Application No.: 10/524,259

Attorney Docket No.: Q86191

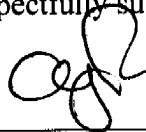
For the above reasons, it is respectfully submitted that the present claims are patentable over Araki '215 in view of Feiring '587, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-39 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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